
From The Times

February 12, 2007

'Blame cosmic rays not CO₂ for warming up the planet'

Lewis Smith, Environment Reporter

The impact of cosmic rays on the climate could be greater than scientists suspect after experiments showed they may have a pivotal role in cloud formation.

Researchers have managed to replicate the effect of cosmic rays on the aerosols in the atmosphere that help to create clouds. Henrik Svensmark, a weather scientist in Denmark, said the experiments suggested that man's influence on global warming might be rather less than was supposed by the bulk of scientific opinion.

Cosmic rays — radiation, or particles of energy, from stars, which bombard the Earth — can create electrically charged ions in the atmosphere that act as a magnet for water vapour, causing clouds to form.

Dr Svensmark suggests that the Sun, at a historically high level of activity, is deflecting many of the cosmic rays away from Earth and thus reducing the cloud cover.

Clouds reflect the Sun's rays back into space and are considered to have an important cooling effect. However, if during periods of high activity the Sun's magnetic field pushes a greater proportion of cosmic rays away from the Earth, fewer clouds will form.

The research, published in the journal *Proceedings of the Royal Society*, concentrates on how ions are created and behave in the atmosphere when cosmic rays from stars hit it.

Cosmic rays were replicated by the use of ultraviolet light that were turned on and off in both short bursts and long exposures to create ions. The researchers found that the presence of ions encouraged the formation of clusters of molecules.

In the atmosphere these clusters of ozone, sulphur dioxide and water are understood to act as aerosols in attracting water vapour, culminating in the formation of clouds.

The number of clusters, according to the report, is proportionate to the number of ions present, which in turn depends on the frequency of cosmic rays reaching the Earth.

"The experiment indicates that ions play a role in nucleating new particles in the atmosphere and that the rate of production is sensitive to the rate of ion density," the report concluded. "One might expect to find a relationship between ionisation and cloud properties. This feature seems to be consistent with the present work."

The report added that the ions were likely to generate a reservoir of clusters of aerosol molecules in the atmosphere that "are important for nucleation processes in the atmosphere and ultimately cloud formation".

The findings are unlikely to change radically the views of mainstream climatologists. Nevertheless, a team of scientists will shortly begin a larger experiment at a particle accelerator in Europe in the hope of learning more about the effects of cosmic rays on cloud cover.

According to the Intergovernmental Panel for Climate Change, by far the biggest influence on climate change is the level of greenhouse gases released by mankind, largely through the use of fossil fuels.

Peter Stott, of the Met Office's Hadley Centre and one of Britain's leading climate scientists, said that Dr Svensmark's theory should be taken "with a cellar of salt". Small, localised effects on cloud formation might be possible but he dismissed the suggestion of cosmic rays being responsible for global warming.

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